CHYLOUS CYSTS OF THE MESENTERY.

BY MILES F. PORTER, M.D.,
OF FORT WAYNE, INDIANA,
Professor of Surgery and Clinical Surgery in The Indiana Medical College; Department of Medicine, Purdue University.

THE basis of this paper consists of a study of the literature on the subject, including the reports of nineteen cases which I have been able to collect, together with one case which occurred in my own practice, of which the following is the report:

J. W., age 22, male. Referred by Dr. A. H. Mouser, of Latty, Ohio. Patient's father was killed by lightning, mother living and well. Both maternal grandparents died of pulmonary tuberculosis. Commencing when he was ten years of age, the patient had numerous attacks of pain in the right lower quadrant of the abdomen. Two years prior to my visit he had a severe attack, which lasted for three months. After that attack he remained well for some months, when he had a milder attack, which lasted a week. This last attack was in July, 1904. In February, 1905, the pain came again and continued intermittently until May 3 of the same year, when I saw him with typical symptoms of obstruction of the bowel. There was a tumor in the right ilac region. Tenderness was not marked and was rather diffuse. The abdomen was markedly tympanitic, and there was no localised muscular rigidity. A diagnosis of appendicitis had been made by Dr. Mouser, in which I concurred. On opening the abdomen through the right rectus a group of chylous cysts was found, together with a volvulus involving that portion of the ileum attached to the mesentery in which the cysts were found. The number of cysts of itself precluded treatment by drainage, their enucleation could not be accomplished without serious danger to the integrity of the gut, besides the vitality of the gut had already been nearly, if not quite, exhausted by the twist. Hence excision of the bowel, together with the mesentery containing the cysts, was done and an end-to-end anastomosis made with the aid of a Murphy button. The abdomen was closed without drainage.

The patient did well until the night of the sixth day, when he commenced to complain of abdominal pain, and died within twelve hours.

A post-mortem examination showed leakage at the mesenteric attachment at the point of anastomosis. The union was perfect throughout the rest of the circumference of the gut. No signs of peritonitis. The button was loose in the gut save for a minute shred of tissue which still held. Figures 1 and 2 are drawings made from the specimen.

Literature.—The literature on the subject so far as the text-books are concerned is very meager. Sutton [1] devotes ten lines to the subject of chyle cysts and Douglas [2] the same space. Greig Smith [3] devotes less than four pages to the entire subject of mesenteric cysts, including their treatment, while Maylard [4] does not mention the subject. In Treves's "System of Surgery" and in the "International Text-Book of Surgery" will be found the best text-book articles I know of on the subject, but both are very short and imperfect. The current literature contains comparatively few articles upon chylous cysts. Among those which I have found I will mention Bramann's,[5] Fetherston's [6] report of a case with the discussion thereon; Mendes de Leon's [7] and Rasch's [8] with the discussion. Moynihan in his excellent paper [9] on "Mesenteric Cysts" devotes three and a-half pages to chylous cysts. Dowd [10] in his paper bearing the same title gives less than two pages to chylous cysts. Carson [11] of St. Louis read a paper upon "Chylous Cysts of the Mesentery" before the American Medical Association in 1889. Unjenim and Petroff[12] wrote an excellent paper on the subject and collected all the cases they could find in the international literature.

History.—The history of the development of this subject was until recently inextricably bound with the history of mesenteric cysts in general, and even now this is true in a great degree, though in later years, as our knowledge has grown, a separate study of chylous cysts has been made by a few writers. Cysts of the mesentery were first classified by Portal in 1803. Dowd [10] in his article gives reference to 145 cases of cyst of the mesentery of the various kinds. Unjenim and Petroff[12] in 1889 reported the first case of chylous cyst in Russian literature and collected nine other cases from international literature. When Bramann's case was operated (1886) no other case was recorded which had been treated surgically. Kilian[13] reported in 1886 a "lymph-cyst" treated surgically; this was two months later than the Bramann case was operated, but before its publication. Carson's case was the first one reported in America, so far as I know, and the largest that had been reported at that time in any country. Rasch was of the opinion that his was the first case of chylous cyst, occurring in a woman, published, but in this he is mistaken, for Kuester and Werth each operated upon a woman in 1882, while the Russian case above referred to antedated that of Rasch a year and Pitman's case was reported[14] in 1857.

Frequency.—Chylous cysts of the mesentery belong to the surgical rarities. When Carson wrote his paper he was able to collect eleven cases, and the writer has been able to find but nine more, including his own, making in all twenty cases. One of these (Eppinger's) is perhaps doubtful, as he reported it as a dermoid cyst, but Werth considered it a chylous cyst.

Concerning the relative frequency of serous and chylous cysts there is considerable difference of opinion among writers. Hahn[15] says that serous cysts are the more common, while Smith[16] and Dowd[10] say that chylous cysts are the more common. In my own research in current literature I have found twenty-nine cases of serous cysts and twenty cases of chylous cyst and am, therefore, forced to side with those who think the serous cysts more common.

Pathology and Etiology.—Dowd[10] in speaking of the origin of chylous cysts says: "Taking these cysts together it seems pretty well established that the chylous cysts are preformed cysts, situated in such close relation to the lacteals that chyle has been effused into them and that they are really of embryonic origin; in structure similar to ovarian and parovarian cysts."

The miscroscopic examination of the specimen removed from Rasch's patient seemed to show in this case that the tumor originated from the rupture of a chyle vessel probably produced by trauma, and in the discussion of this paper Doran

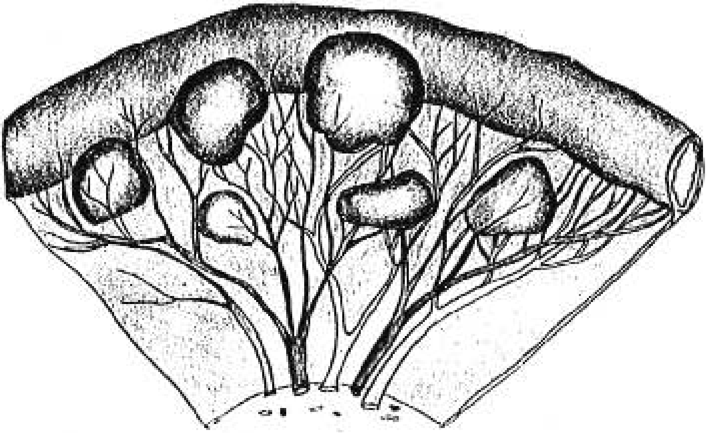

FIG. 1.—Author's case. Showing bowel with mesentery and cysts excised. Multiple.

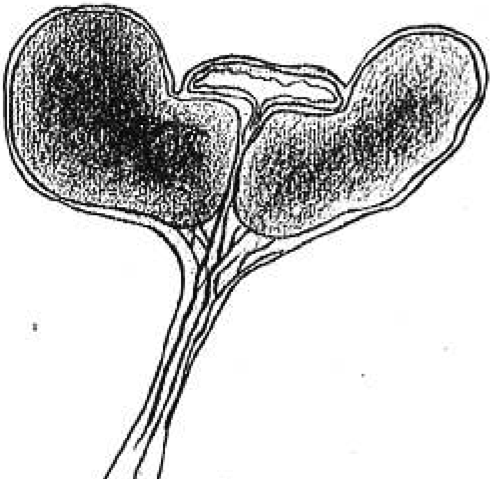

FIG. 2.—Drawn from transverse section through specimen from author's case. Showing flattening and compression of bowel by cyst.

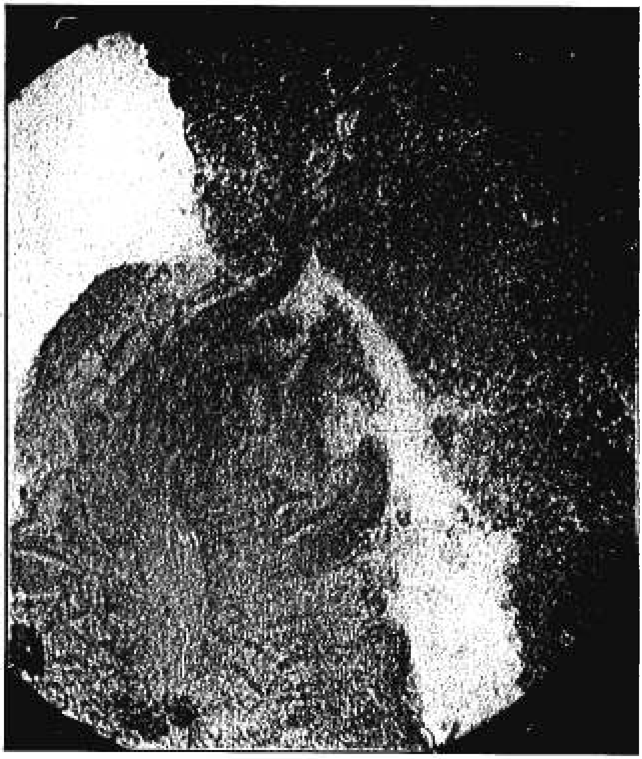

FIG. 3.

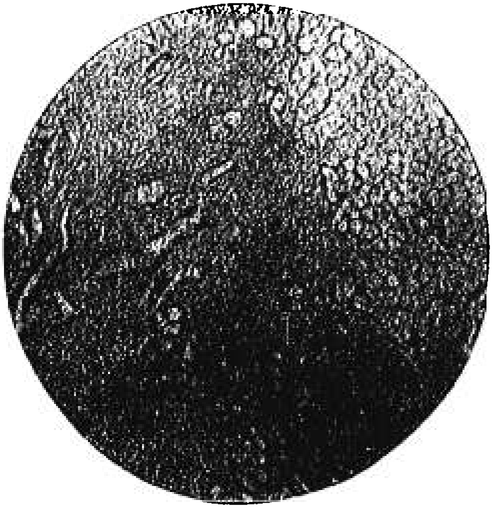

FIG. 4.

agreed entirely with this view. Upon similar evidence it was determined that Fetherston's case[9] originated in a lymph gland. The specimen from Bramann's case[5] presented no endothelium nor epithelium on the inner surface of the cyst wall and originated most probably, as did Rasch's, from the rupture of a lymph vessel. According to Carson[11] eight of the cases collected by him were due to degeneration of lymph glands and three to dilatation of lymphatics. Von Blum suggests as a common origin typhoid or tubercular degeneration of mesenteric glands.

That a few cases of chylous cysts have been reported which had their origin in the dilatation of the receptaculum chyli or large retro-peritoneal lymphatics there can be no doubt, but cysts having this origin are not likely to occupy the mesentery but are usually in close contact with the spine, as in the case reported by Scharlemmer.[17] In my own case there were several distinct and relatively widely-separated cysts. Chemical and microscopical examination of the contents of the cysts proved it to be chyle. The report of the microscopical examination of the specimen, made by D. J. B. McEvoy is as follows:

> The gross specimen submitted for examination consisted of a portion of intestine about four and one-half inches long with attached mesentery. In the mesentery there were several cysts from which the fluid had been evacuated.
>
> The specimen illustrated in photograph number 3, was taken from the wall of a large cyst next to the bowel. A cube was removed from the floor of this cyst next to the intestine and included a portion of the bowel wall which was continuous with the base of the cyst. Microscopical examination of this cube shows a great increase in the lymphatic tissue of the bowel wall. The bowel mucosa still shows the outline of the secreting glands, which are normal to the part, but the epithelial lining has been destroyed and the lumen filled with lymph-cells. These lymph-cells also distend the periglandular structure. In some places we find a layer of lymph-cells covering the mucosa. Beneath the mucosa, infiltrating the muscular layer of the bowel and extending upwards to form the floor of the cyst, was a mass of lymphatic tissue consisting of cells in all stages of amœboid movement.
>
> Photograph number 4 was taken from a section of an enlarged mesenteric gland in the vicinity of the cyst.
>
> Microscopical examination shows capsule to be intact. The structure does not differ from the normal gland except we find a general hyperplasia of all the elements.

The photograph shows the lymph spaces of the periphery and compact masses of lymph tissue below.

These micro-photographs were made with the low power to include a wide field.

Undoubtedly, then, we are warranted in coinciding with Moynihan[9] in the opinion that the origin of chylous cysts is manifold, and disagreeing with Dowd[10] when he says that they are all embryonic in origin. It naturally follows that there can be nothing constantly distinctive in the pathology of chylous cysts of the mesentery except their contents and their location between the folds of the mesentery. Microscopically glandular endothelium will be found in cysts originating in degeneration of lymph-glands and endothelium in those originating from dilatation of lymph vessels; provided, however, atrophy of these elements has not resulted from pressure. Naturally those cysts arising from rupture of lymph-vessels will not present endothelium on the inner surface of their walls.

These cysts may be unilocular or multilocular, single or multiple. Multilocular chylous cysts may undoubtedly become unilocular by pressure-absorption, just as obtains in ovarian cysts. It is also possible for multiple cysts to become by this same process first multilocular and single and finally single and unilocular.

In appearance these cysts are usually creamy white and have large vessels traversing their walls. Accidents such as volvulus, hæmorrhage into the cyst or cyst-wall and peritonitis may change their color and render the vessels indistinct. Usually these cysts have no distinct pedicle, but they may have. The relation of the bowel to the cyst varies much. The accompanying illustrations (Figs. 5, 6, 7, and 8) show some of the varying conditions that have been noted along these latter lines.

Diagnosis.—An exact diagnosis is practically impossible, neither is it necessary. It goes without saying that one cannot have any idea of the character of the cyst contents until he sees it, unless tapping is resorted to, and this proceeding is to be condemned.

Developing in the mesentery of the small intestine, as the large majority of these tumors do, their location and

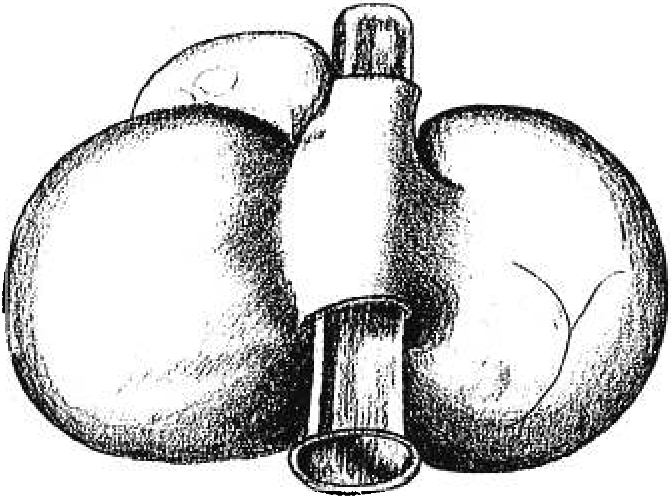

FIG. 5.—From Moynihan. Annals of Surgery. Vol. XXIV. Tube passes through gut.

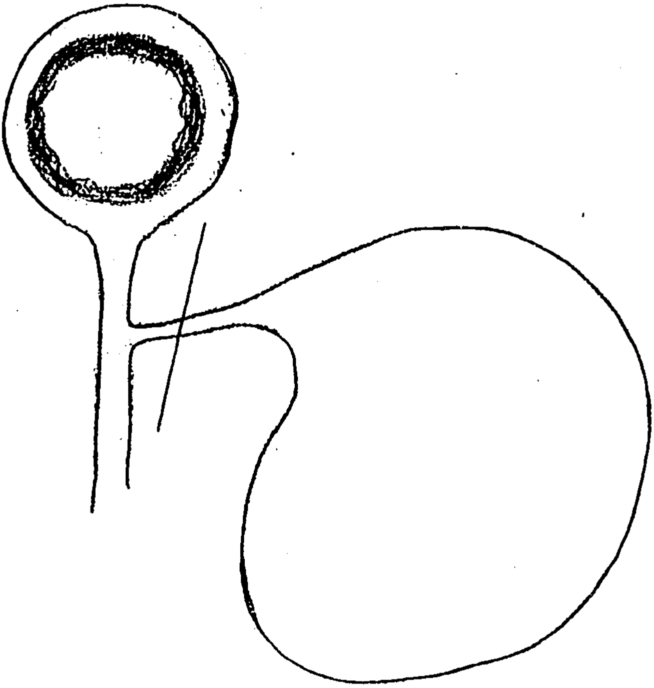

FIG. 6.—From Moynihan. Showing cyst with pedicle. Gut was strangulated from traction on pedicle. Unilocular.

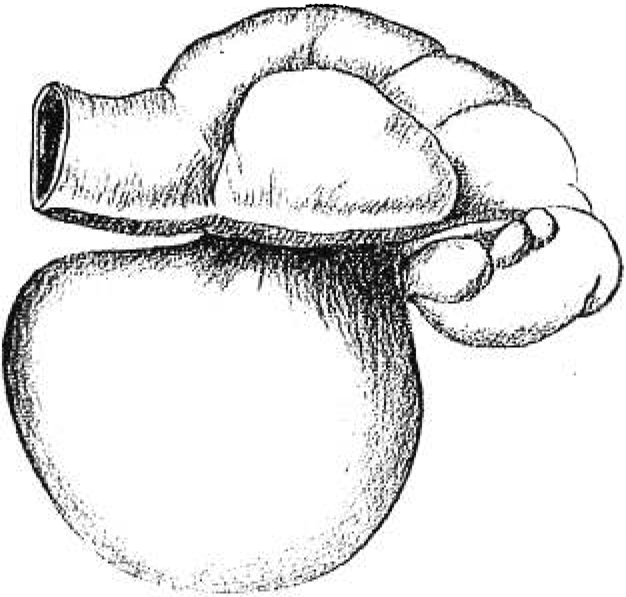

FIG. 7.—From Moynihan, Multilocular cyst.

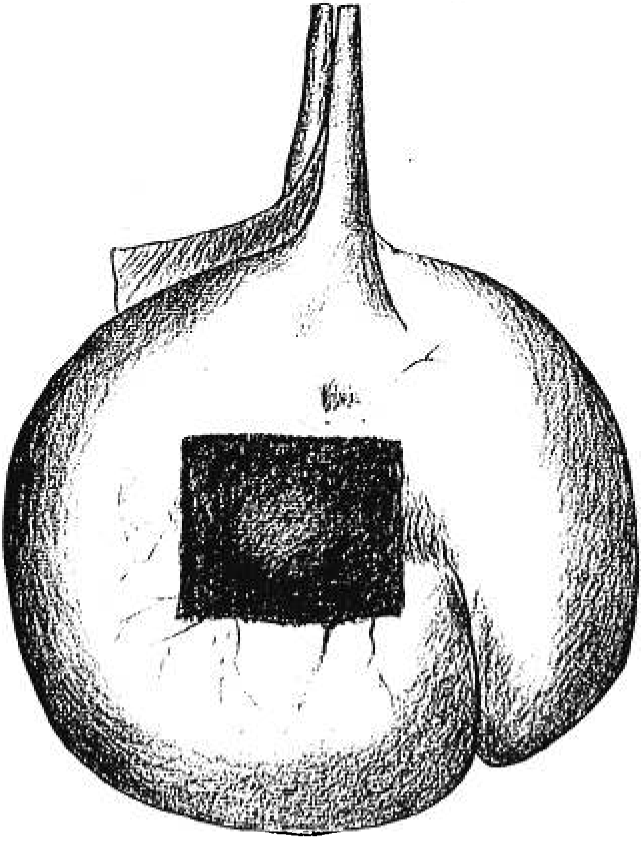

Fig. 8.—Robson's case. From Moynihan. Small pedunculated cyst.

attachment, when the latter is determinable, is somewhat distinctive. A centrally located, movable, fluctuating tumor would raise a strong suspicion of mesenteric cyst, and if the tumor were crossed by a portion of intestine the suspicion would become a conviction. Cysts of the mesentery more often cause abdominal pain than do any cystic abdominal tumors. Hence the diagnostic significance of pain in these cases. The same thing may be said of vomiting, also. Especially significant are these symptoms if unaccompanied by signs of infection or other complications. Von Blum [18] was the first to call attention to the diagnostic significance of recurring attacks of volvulus in mesenteric cyst. The patient whose case he reported had had five or six attacks prior to time of operation. This was true of my own case and also of several others of which I have read the reports.

Recurrent attacks of belly pain, accompanied by symptoms of bowel obstruction in a case presenting a centrally attached abdominal tumor, would strongly suggest mesenteric cyst.

Chronic increasing obstinate constipation is not infrequently present in these cases and is due to the stretching and flattening of the bowel as it crosses the cyst.

The age of the patient is of little or no diagnostic importance. A number of cases under ten years are reported, but the average age in fifteen cases was found to be over thirty-four years.

The frequency with which the history of trauma is given by these patients would seem to show that this might be of some aid in differential diagnosis. In some cases, as in my own, for instance, where there were a number of relatively widely separated small cysts which produced no appreciable tumor until volvulus resulted, even an approximately correct diagnosis will not be possible before the abdomen is opened.

With care, however, the diagnosis of mesenteric cysts may be made in the majority of cases, though the character of the cyst contents cannot be determined until the abdomen is opened.

Treatment.—That mesenteric cysts of all kinds seriously endanger life there can be no question, hence there can be no question but that their removal as soon as the diagnosis is made is the only proper line of treatment to follow. As to exactly what method should be adopted in their removal there is great difference of opinion, but it appears evident that this difference arises from the fact that conclusions have been reached from too narrow premises. Those cysts which have a well-defined pedicle are best removed after ligating the pedicle, as in ovarian cysts. Others may be easily and safely enucleated; others will be best treated by stitching the open sac to the parietal peritoneum and draining.

The fear entertained by some, and very naturally, that there might be danger of a permanent chylous fistula in cases treated by drainage has proven unfounded.

There are other cases in which resection of the bowel, together with that portion of the mesentery containing the cyst or cysts, will be required. Such a procedure seemed best in my case. Drainage was out of the question because of the number of the cysts, while either enucleation or excision would certainly have led to gangrene of the bowel.

CONCLUSIONS.

1. Chylous cysts of the mesentery are to be classed with the surgical rarities, being less common even than serous mesenteric cysts.

2. Many chylous cysts of the mesentery begin as multiple cysts, later become multilocular and finally unilocular by the process of pressure-absorption.

3. The origin of chylous cysts is manifold and the microscopic pathology varies equally.

4. Trauma seems to be a causative factor in quite a number of chylous cysts.

5. Diagnosis of cyst of the mesentery may be impossible, but in the majority of cases can be made before opening the abdomen, but the character of the cyst contents cannot be determined by any safe procedure until the belly is opened.

6. The treatment of chylous cysts of the mesentery consists in their removal by that technic which seems best adapted to the case in hand after it has been studied through the open abdomen.

TABLE OF CASES.

No.	Reporter.	Where Reported.	Age.	Sex.	Origin.	Operation.	Result.	Remarks.
1	Bramann.	Langenbeck's Archiv., Vol. 35.	63	M.	Receptaculum chyli. Between folds of mesentery.	Incision, walls stitched to skin and drained.	R.	Tumor was size of child's head.
2	Kilian.	Berlin. K. Woch., Nov. 25, 1888.	61	F.	Thoracic duct.	Incision and drained.	R.	Had been tapped twice and refilled (4700 cc. chyle withdrawn).
3	Kuester.	Ein Chir. Erkentniss, Berlin, 1882.	21	F.	Between folds of mesentery.	Extirpation.	D.	Death due to peritonitis from wounding bowel. Size of adult head
4	W.	Milliard and Tilhaut's paper, Berlin. K. Woch., 1887. No. 23.	31	M.	Degenerated mesenteric gland.	Extirpation.	R.	Kidney size.
5	Werth.	Archiv. f. Gynecol., 1882. Vol. 19.	?	?	Mesenteric gland.	Extirpation.	R.	Size of child's head.
6	Wyenin and Petroff.	Dhevnik Kazans Kaho Obsch. Watchis, Nos. 7 and 8, 1888; also London Med. Record, Aug. 20, 1888.	26	F.	Mesenteric glands.	Extirpation.	R.	Case was Wyenin and Petroff's, operated by Fenominoff.
7	Carson.	Jour. A. M. A., May 10, 1890.	42	M.	Not known.	Incision and drainage.	R.	Large as adult head. Wall very thick and hard.
8	Moynihan.	ANNALS OF SURGERY, July, 1897.	18	F.	Mesentery of ileum.	Enucleation.	R.	Operated in second attack of pain, tenderness and vomiting.
9	Moynihan.	ANNALS OF SURGERY, July, 1897.	7	M.	Mesentery of ileum.	Pedicle ligated and cyst removed.	D.	Pain, tenderness and vomiting were symptoms.
10	Syms.	ANNALS OF SURGERY, Vol. 23, p. 605.	19	M.	Mesentery of ileum.	Cyst enucleated, mesentery closed.	R.	Contained 14 ounces of chyle.

TABLE OF CASES—*Continued.*

No.	Reporter.	Where Reported.	Age.	Sex.	Origin.	Operation.	Result.	Remarks.
11	Eppinger.	By Carson in Jour. A. M. A., May 10, 1890.	Not given.	Not given.	Not given.	Found post mortem.	....	Reported as dermoid, but regarded as chylous by Werth.
12	Rosch.	Trans. London, Obs. Soc., 1889.	27	F.	Mesentery of small bowel.	Cyst stitched to abdominal wall and drained.	R.	Six pints of chyle. Pain in belly led to discovery of tumor.
13	Mendes de Leo.	Amer. Jour. Obs., Vol. 24, 1881.	27	F.	Not given.	Cyst opened, stitched to abdomen, drainage.	R.	Tumor very movable and caused severe pain.
14	Fetherston.	Australian Med. Journal, 1890. New Series, No. 12.	33	F.	Mesentery of ileum.	Well-formed pedicle, transfixed and tied.	R.	Three pints chyle. Had had several severe attacks of belly pain. Glass drainage in abdomen.
15	Porter.	Present paper.	22	M.	Mesentery of ileum, degenerated lymph-glands.	Excision of cysts with bowel, anastomosis with Murphy button.	D.	Died from small leakage of mesenteric attachment, which occurred on seventh day. Numerous attacks of belly pain.
16	Rokitausky.	Lehrbuch der Pathol.	53	M.	Mesenteric gland.	Found post mortem.	....	
17	Enzmann.	Basle Quang. Dis.	77	F.	Thoracic duct.	Patient died of endocarditis.	....	Walls of cyst thick and flabby. Contents inspissated chyle, cinnamon brown in color.
18	Rokitausky.	Lehrbuch der Pathol.	36	M.	Mesenteric gland.	Found post mortem.	....	Several small cysts with thick walls and white contents, and one size of child's head, lobulated and containing rosy fluid with glutinous red and black lumps.
19	Virchow.	Berlin. K. Woch., Nov. 14, 1887.	Not given.	Not given.	Not given.	Post mortem.	....	Multilocular.
20	Pitman.	Brit Med. Jour., May 16, 1887.	23	M.	Mesentery of small bowel.	Post mortem.	....	Patient died of peritonitis due to bowel obstruction.

SUMMARY OF TABLE.

Whole number of cases reported, 20.

Number operated upon, 14.

Total deaths in operated cases, 3.

Number of cases treated by excision or enucleation of cyst, 8, of which 6 recovered and 2 died.

Number of cases treated by incision, stitching sac to abdomen and draining, 5, all of which recovered.

One case treated by excision of cyst, mesentery, and bowel, died.

Only 6 cases were found reported post mortem, which would seem to prove that when present chylous cysts of the mesentery usually manifest themselves by symptoms sufficiently pronounced to lead the host to consult a physician.

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